

In vitro antioxidant and in vivo hepatoprotective effect on ethanol-mediated liver damage of spray dried *Vernonia amygdalina* water extract

ABSTRACT

Vernonia amygdalina is a strong natural antioxidant that possessed various medicinal properties. In this study, the spray-dried water extract of *V. amygdalina* was evaluated for its in vitro antioxidant capacity and in vivo hepatoprotective effect against alcoholic-mediated liver damage. Total phenolic and flavonoid content of spray-dried *V. amygdalina* water extract were determined. Liver enzyme profiles, liver antioxidant level and nitric oxide level were evaluated in alcohol-induced liver injured mice or co-supplement with spray-dried *V. amygdalina*. Water extract of spraydried *V. amygdalina* that contained phenolic content of 24.8 ± 1.5 mg/g gallic acid equivalent and total flavonoid content of 25.7 ± 1.3 mg/g catechin equivalent was able to inhibit 50% of xanthine and tyrosinase oxidation at 170 $\mu\text{g/mL}$ and 2 mg/mL, respectively. On the other hand, extracts at both 10 and 50 mg/kg body weight were able to reduce the levels of Alanine transaminase (ALT), Alkaline phosphatase (ALP), Aspartate transaminase (AST), triglyceride and total bilirubin content in the alcohol-mediated liver injury in mice. Furthermore, it also helped to increase levels of Superoxide dismutase (SOD), Ferric reducing ability of plasma (FRAP) and reduce the levels of Nitric oxide (NO) and Malondialdehyde (MDA) in the liver of the treated mice. These results suggested that water extract of spray-dried *V. amygdalina* exhibited liver protective effect, which could be contributed by its antioxidant properties.

Keyword: Spray-dried water extract; Phenolic; flavonoid; Alcohol; Liver damage